

HISTORY OF THE EVA WIKI

Presented by:
Daren Welsh & James Montalvo



Extravehicular Activities
Instructor & Flight Controller
NASA Johnsons Space Center
SMW Fall Summit
3 Oct 2014

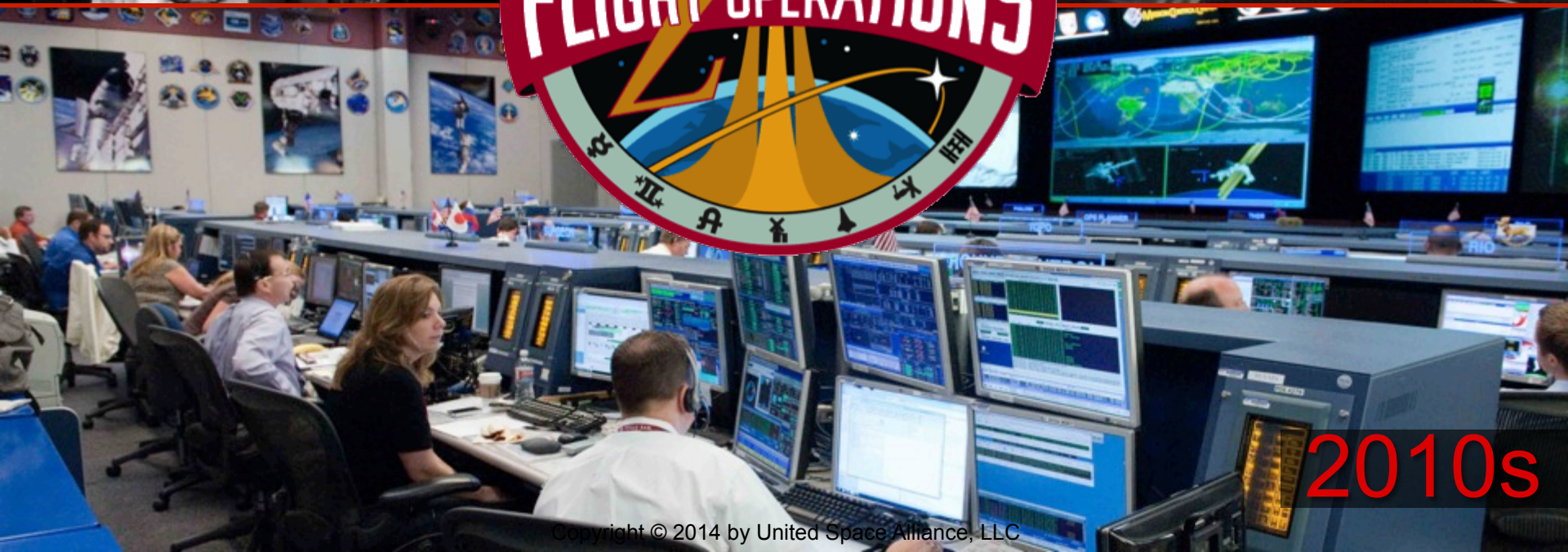
WHAT WE DO

- Flight Operations
 - Plan, Train, Fly
- Extravehicular Activity (EVA)
 - NASA Speak for “SPACEWALK”

1960s



1980s



2010s





The “Old Way”



- Multiple file type/sources
 - Lead to conflicting information
 - Poor revision control
 - Updates required multiple files to be revised
 - File deletion or override was not uncommon
 - Which file type/source was most trusted?





The “Wiki Way”

- A single source for information
- Outside databases and sources can be linked from wiki pages
- Better revision control
- Not just file searchable, but content searchable
- Semantic



PISTOL GRIP TOOL



Pistol Grip Tool (PGT)

Part #: ABC12345

Mass: 10.6 lbs.

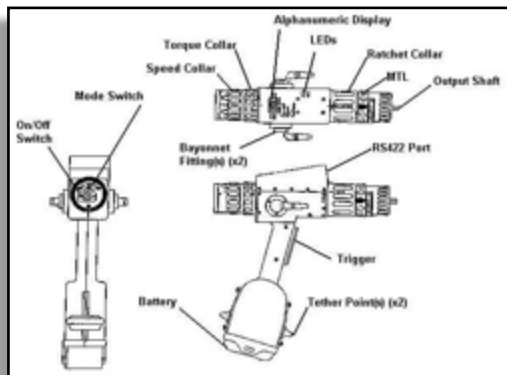
Length: 15 in.

Width: 5.3 in.

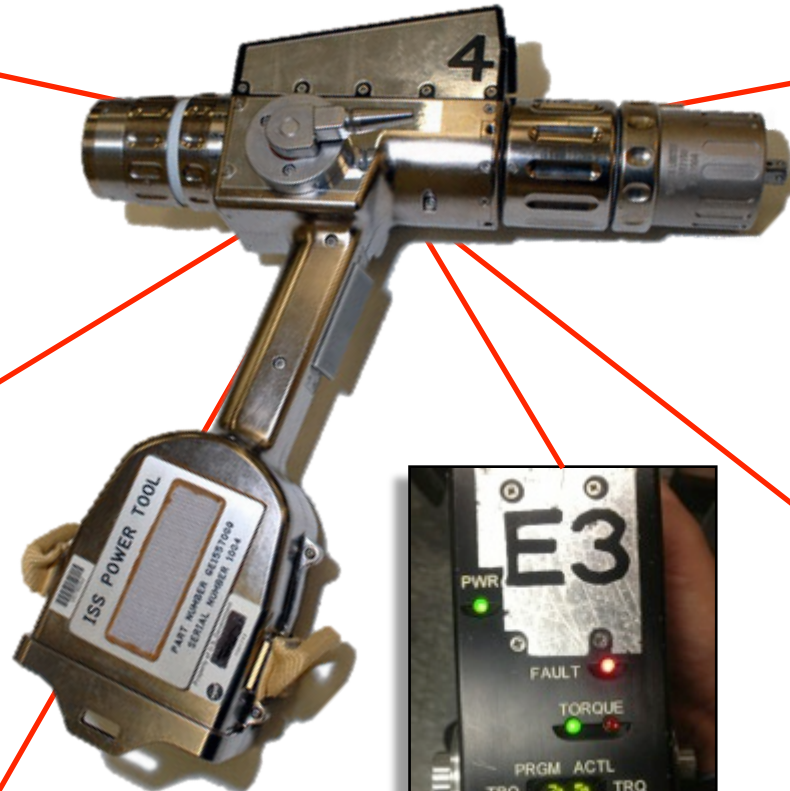
Height: 14 in.

Torque Settings [edit]					
Setting	Torque Setpoint (ft-lb)	Torque Window (ft-lb)	Torque Threshold (ft-lb)	Turns	
A1	2.5	±1.0	1.0	—	—
A2	3.8	±1.0	1.0	—	—
A3	4.8	±1.0	1.0	—	—
A4	6.3	±1.0	1.0	—	—
A5	7.0	±1.0	1.0	—	—
A6	8.3	±1.0	1.0	—	—
A7	9.2	±1.0	1.0	—	—
B1	12.0	±1.0	1.0	—	—
B2	16.0	±1.2	1.0	—	—
B3	18.4	±1.7	1.0	—	—
B4	19.4	±1.9	1.0	—	—
B5	22.0	±2.0	1.0	—	—
B6	24.0	±2.0	1.0	—	—
B7	25.5	±2.0	1.0	—	—

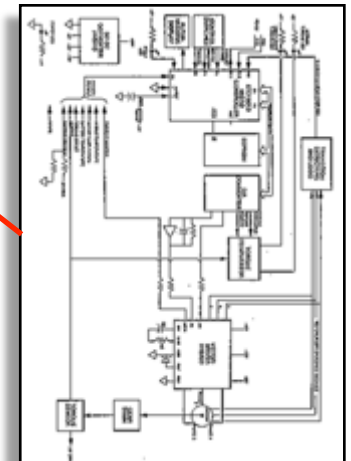
TORQUE DATA



DRAWINGS



SOCKETS



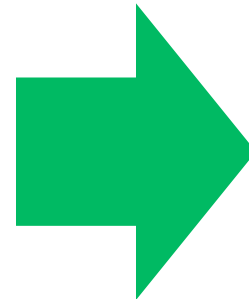
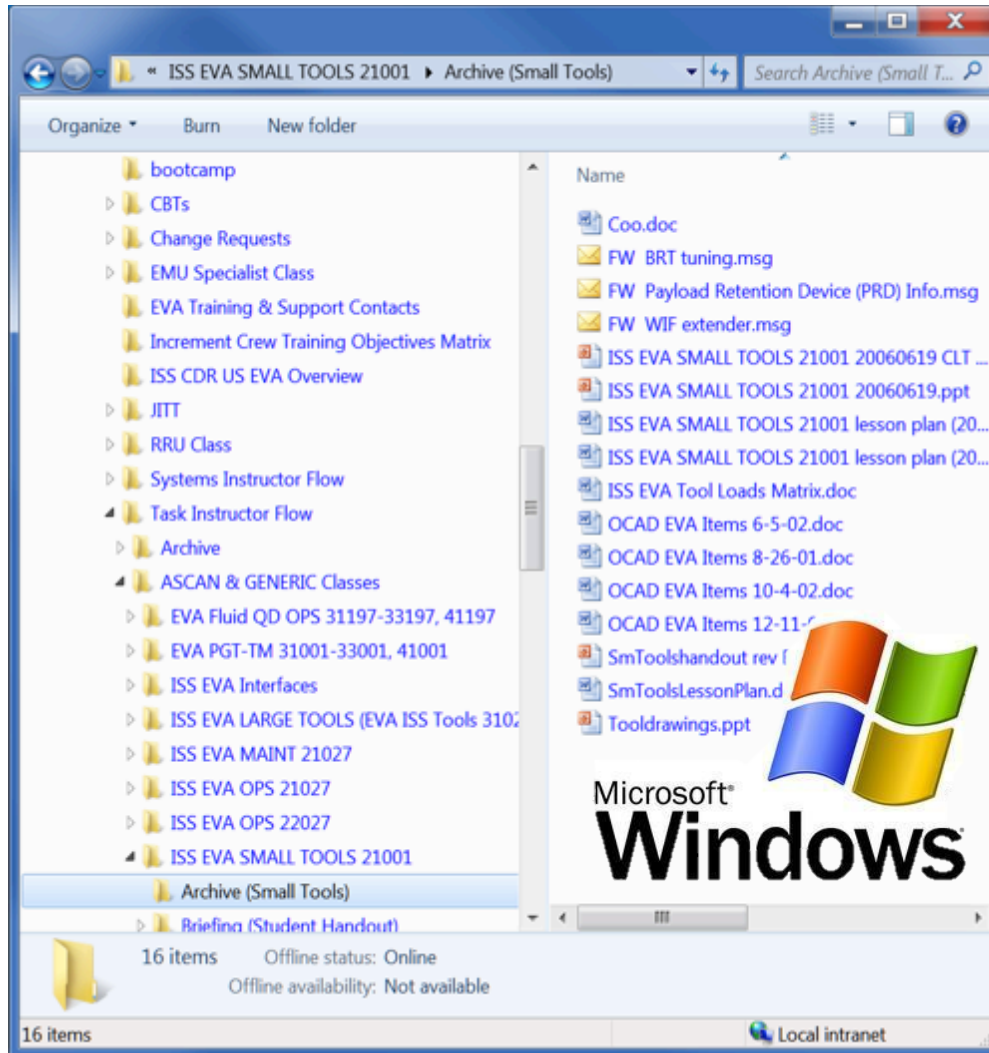
SCHEMATICS



ANOMALIES



Culture Shift



Proof of Concept



Proof of Concept

- Added content to wiki through annual proficiency training
 - Allowed for minimal duplication of work
- Installed Semantic
 - Shed light on deficiencies in current knowledge management system
- A demo was presented to management, once **critical mass** was achieved

Hurdles

A man in a dark suit and tie is captured mid-air, jumping over a hurdle on a red running track. The background shows a clear blue sky and some distant trees. The image is used as a metaphor for overcoming challenges or hurdles.

- There is a double standard for wikis
 - Wiki makes info easier to access/edit/share information
 - Initially this was viewed as a negative, not a positive by management
 - Can the wiki be trusted?
 - Sharepoint/word/PDF/ documents were just as vulnerable to revisions or access control issues

Demonstrating Value

- Wiki = One stop shop for information
- Helps reveal gaps in knowledge management
- Promotes group ownership of knowledge
 - “Our Wiki”





Imagery


- NASA's Imagery Online Database





Imagery

- Built templates and queries to create custom galleries



MOD Wikia
Current ISS Issues
Increments
EVA History
Lesson Plans
Flight Control
EVA Tools
EVA Interfaces
EMU
Airlock
DX3 Personnel
Random page

Contribute
Help
Recent changes
Wanted pages

Forms

Query

Tools
What links here
Related changes
Upload file
Special pages
Printable version
Permanent link
Page information
Browse properties

Image Gallery of EVA Tools

0.5" QD Spool Positioning Device	1" Anti Kickback Tool	1" Button Depress Tool	1" Fluid QD Cap Tool	1" Male Vent Tool	1" NH3/N2 Vent Tool - Female	1" QD Spool Positioning Device	1.5" Ball Control Tool	1.5" QD Spool Positioning Device
1/2" x 8" Wooden Socket	1/4" Button Depress Tool	1/4" Cap Tool	1/4" NH3/N2 Vent Tool - Female	1/4" Hex Socket Driver with 6" Extension	18" Socket Tool Panel	3/16" Allen Hex Driver	3/4" Anti Kickback Tool	3/4" Button Depress Tool
3/4" NH3/N2 Vent Tool - Female	5/32" Ball End Driver	5/8" x 12" Wooden Socket	5/8" x 2" Right Socket	68 ORU Cover	90 Degree Jaws Circular Connector Tool	ACME Bolt Interface Hex L-Wrench Tool	ACME Bolt Tool	APFR Interface
AUX Bag 1	AUX Bag 2	Adjustable Equipment Tether	Adjustable Equipment Tether Smaller	Adjustable Fuse Tether	Adjustable Grapple Bar	Ammonia QD Vent Tool Adapter	Articulating Portable Foot Restraint	Burr/Router Anti-Rotation

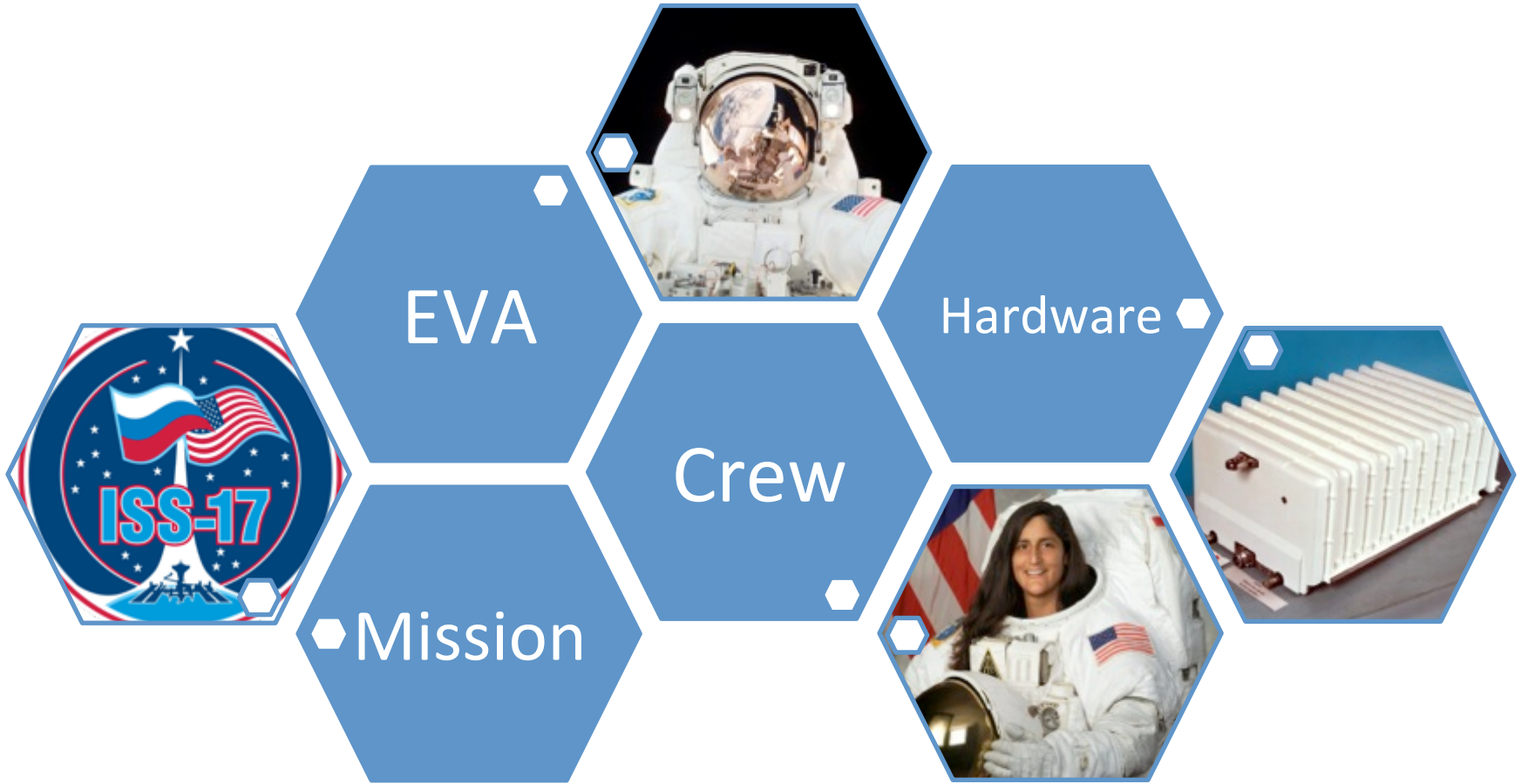


Meeting Minutes

- Until wiki was implemented, Meeting Minutes were captured via email
 - Information was lost in crowded inboxes
 - Cumbersome to search
- SMW was used to create Meeting Minutes form
- Served as a catalyst to get new users involved in the wiki
 - Editing, creating pages
- More on our wiki solution later...
 - Presentation from Daren Welsh



Mission/EVA History





Mission/EVA History

Current and Upcoming Expeditions [\[edit\]](#)

SMW allowed us to build a complex set of related pages easily

```
{{#ask: [[Category:Expedition]] [[Mission end date::>{{CURRENTYEAR}}-{{CURRENTMONTH}}-{{CURRENTDAY}}]]
```

```
|? Mission start date
```

```
|? Mission end date
```

```
|? Has mission patch
```

```
| link=none
```



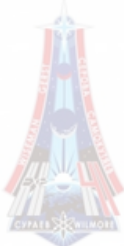
```
| format=template
```

```
| template=Expedition table row
```

```
| intro=<table class="wikitable smwtable"><tr><th>Patch</th><th>Expedition</th><th>Start (may be approximate)</th><th>End (may be approximate)</th><th>Crew</th><th>DX3 Team</th></tr>
```

```
| outro=</table>
```

```
}}
```

	Expedition 39	13 May 2014	11 September 2014	<p>CDR: Koichi Wakata</p> <p>FE-1: Aleksandr Skvortsov</p> <p>FE-2: Oleg Artemyev</p> <p>FE-3: Mark S. Surayev</p> <p>FE-4: Mikhail Tyurin</p> <p>FE-5: Rick Mastracchio</p>	<p>XA Increment Lead: Linda Thomas</p> <p>Suit Engineer: Roger Graham</p> <p>EVA TASK: Bridget Scheib</p> <p>EVA Systems OJT: Carlos Rodriguez</p> <p>EVA Support: Slusser</p> <p>EVA Lead: Jaclyn Kagey</p> <p>EV&CS: Lloyd Irwin</p> <p>EV&CS: Davey Moore</p> <p>EV&CS: Janae Lestishen</p>
	Expedition 40	13 May 2014	11 September 2014	<p>CDR: Steve Swanson</p> <p>FE-1: Aleksandr Skvortsov</p> <p>FE-2: Oleg Artemyev</p> <p>FE-3: Mark S. Surayev</p> <p>FE-4: Reid Wiseman</p> <p>FE-5: Reid Wiseman</p>	<p>XA Increment Lead: Linda Thomas</p> <p>Suit Engineer: Roger Graham</p> <p>EVA Task OJT: Stephanie Johnston</p> <p>EVA TASK: Daren Welsh</p> <p>EVA Systems OJT: Mark Willsey</p> <p>EVA SYSTEMS: Brian Alpert</p> <p>EVA Lead: Paul Dum</p> <p>EV&CS: Janae Lestishen</p> <p>EV&CS: Lloyd Irwin</p> <p>EV&CS: Davey Moore</p>
	Expedition 41	11 September 2014	10 November 2014	<p>CDR: Maksim Surayev</p> <p>FE-1: Reid Wiseman</p> <p>FE-2: Alex Gerst</p> <p>FE-3: Aleksandr Samokutyayev</p> <p>FE-4: Yelena Serova</p> <p>FE-5: Barry Wilmore</p>	<p>EVA TASK: Allie Battocletti</p> <p>EVA TASK: James Montalvo</p> <p>EVA SYSTEMS: Sandy Fletcher</p> <p>EVA SYSTEMS: James Gaustad</p> <p>EVA Lead: Glenda Brown</p> <p>EV&CS: Juan Davalo</p> <p>EV&CS: Jesus Castillo</p> <p>EV&CS: Jack Sansom</p>



Mission/EVA History



- The possibilities are endless
- What if you want to list all the ISS Commanders?

Wikitext:

```
{{#ask: [[Category:Expedition]]  
| Mainlabel=Expedition  
| ? Commander  
| sort = Mission start date  
| order = asc  
}}
```

Output:

Expedition	Commander
Expedition 1	Bill Shepherd
Expedition 2	Yuri Usachev
Expedition 3	Frank Culbertson
Expedition 4	Yuri Onufrienko
Expedition 5	Valery Korzun
Expedition 6	Ken Bowersox
Expedition 7	Yuri Malenchenko
Expedition 8	Mike Foale
Expedition 9	Gennady Padalka
Expedition 10	Leroy Chiao
Expedition 11	Sergei Krikalev
Expedition 12	Bill McArthur
Expedition 13	Pavel Vinogradov
Expedition 14	Mike Lopez-Alegria
Expedition 15	Fyodor Yurchikhin
Expedition 16	Peggy Whitson
Expedition 17	Sergey Volkov
Expedition 18	Mike Fincke
Expedition 19	Gennady Padalka

INVENTORY MANAGEMENT





Inventory Management System (IMS)



MCC-H-5961 [11] Inventory Management System - ISSEVA2

IMS Window Item BCR

Search window

START AND * = TREE = On-board...

TREE = On-board (Storage Location or Lost)

	PART NUMBER	S/N	OPNOM	BARCODE	Location
Storage Locati...	1011		EVA Ratchet		AIL100_Behind Close...
Storage Locati...	1012		EVA Ratchet		AIL100_Behind Close...
Storage Locati...	1015		EVA Ratchet		AIL1_Crewlock_IVA Bag
Storage Locati...	1016		EVA Ratchet		LAB1_External

ISS \AIRLOCK\CREWLOCK\ Crew Lock IVA Bag 1002 \Adjustable Fuse Tether 1032 \EVA Ratchet 1015 Row count: 4

Object properties

Main Detail History

PART NUMBER 1015 CAGE CODE NASA

S/N 1015 QPU 1

OPNOM EVA Ratchet

RUSSIAN NAME Трещеточный вороток с квадратом 3/8 дюйма

ENGLISH NAME 3/8" DRIVE RATCHET ASSY.

LOCATION AIL1_Crewlock_IVA Bag

BARCODE RFID tag attached

LABEL

STATUS Stowed

FILL FACTOR FREE, ctb

LAUNCH 12A.1

NOTES Stowed per EVA-TOOL-STOW on GMT 114/14. CHECK MCC-H BEFORE USE. aka Ratchet Wrench.

ISS \AIRLOCK\CREWLOCK\ Crew Lock IVA Bag 1002 \Adjustable Fuse Tether 1032 \EVA Ratchet 1015

Tree window

Storage Location

- AIRLOCK1 Ext
- CREWLOCK
 - Crew Lock IVA Bag 1001
 - Crew Lock IVA Bag 1002
 - Adjustable Fuse Tether 1029
 - Adjustable Fuse Tether 1032
 - Connector Cleaner Tool Kit 1001
 - EVA Ratchet 1015
 - PGT 1007
 - Pry Bar 1004
 - Vise Grip Pliers 1001
 - EVA Handrail Clamp 1002
 - EVA Wipe NA_INC32_0001
 - STAGING BAG POCKET STAGING BAG POCKET
 - Crewlock EVA Bag #1 1001
 - Crewlock EVA Bag #2 1004
 - Crewlock EVA Bag #3 1002
 - Crewlock EVA Bag #4 1003
 - Air
 - Forward
 - 2.0 CTB 1055
 - 2.0 CTB 1086
 - 2.0 CTB 4080
 - SEMU 3005
 - Inner Hatch Window Shield 1002
 - ECOK NA_39S_1149
 - ECOK NA_39S_1366
 - Pre-Breathe Hose Kit NA_01
 - Pre-Breathe Hose Kit NA_02
 - Pre-Breathe Spares Kit
 - SAFER STOWAGE BAG 1011
 - SAFER STOWAGE BAG 1012
 - SAFER STOWAGE BAG 1013
 - Instruction Markers, Hatch MOD NA_FLT1/JA_00499

ISS \AIRLOCK\CREWLOCK\ Crew Lock IVA Bag 1002 \Adjustable Fuse Tether 1032 \EVA Ratchet 1015

Search window Storage Location EVA Ratchet

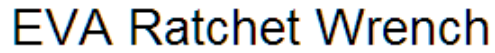
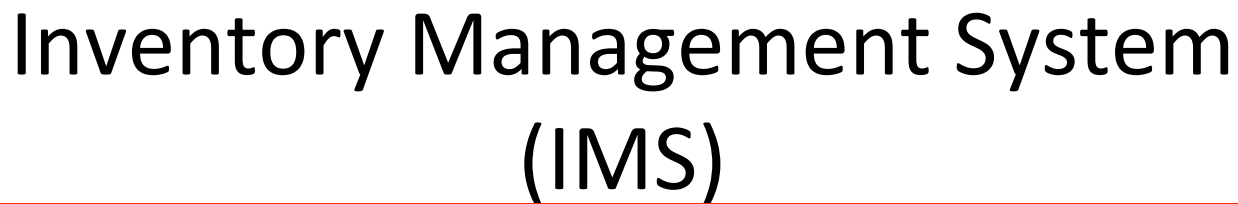
Workspace loaded



Inventory Management System (IMS)



Ops Nom	Parent	Label	Cur Loc	BarCode	Serial#	Part#	Status	Type	Notes
EVA Ratchet	Bag, Kit or Container Item is located in		LAB1_External		1016	SEG333088927-303	Stowed	EQ	Stowed during STS-132 EVA. S/N not confirmed as the one stowed external. CHECK MCC-H BEFORE USE, aka Ratchet Wrench Home is 1.0 CTB S/N 1161. Slot #3
EVA Ratchet	Bag, Kit or Container Item is located in		A/L100_Behind Closeout		1011	SEG333088927-303	Stowed	EQ	Stowed per EVA-TOOL-STOW on GMT 114/14. CHECK MCC-H BEFORE USE. (aka Ratchet Wrench) Home is 1.0 CTB S/N 1161.
EVA Ratchet	Bag, Kit or Container Item is located in		A/L100_Behind Closeout		1012	SEG333088927-303	Stowed	EQ	Stowed per NORS PREP A/L RECONF tasklist activity on GMT 093/14. CHECK MCC-H BEFORE USE. aka Ratchet Wrench. Home is 1.0 CTB S/N 1161
EVA Ratchet	Bag, Kit or Container Item is located in		Returned		1009	SEG333088927-303	Return	EQ	Returned per EVA
EVA Ratchet	Bag, Kit or Container Item is located in		A/L1_Crewlock_IVA Bag		1015	SEG333088927-303	Stowed	EQ	Stowed per EVA-TOOL-STOW on GMT 114/14. CHECK MCC-H BEFORE USE. aka Ratchet Wrench.



Contents [hide]

- 1 Features
- 2 Usage
- 3 Limit Loads Per (GCAR 2081 Rev C)
- 4 Anomalies
- 5 References

Features [\[edit\]](#)

The ratchet rotates 360 degrees in both clockwise and counter-clockwise directions. The direction is changed by rotating the collar located below the palm wheel. The palm wheel provides an alternative hand hold for turning the ratchet. The palm wheel can be released by depressing the button in the middle.

Usage [\[edit\]](#)

The ratchet wrench is compatible with the Cheater Bar

The ratchet wrench, Cheater Bar, and Torque Multiplier cannot be used in combination.

The palm wheel should be used for turns only; initial and final torques should be completed by using the ratchet handle. The palm wheel on the ratchet is limited to 30in-lb.^[1] Higher forces can shear the drive shaft which retains the pieces of the ratchet head together. (1g Class III unit came apart into 6 pieces when the shaft sheared). The load rating when using the ratchet handle is 120 ft-lb.

Height (in.)	3.06
--------------	------

Copyright © 2014 by United Space Alliance, LLC

Tool Info



Alias	Ratchet
Part Number	██████████
Links	IMS
	Certification
	Drawing (NDC Credentials)
	CMC Imagery
Mass (lbs.)	2
Length (in.)	15.53
Width (in.)	3.5
Height (in.)	3.06



Inventory Management System (IMS)



Wikitext:

{{#ims: ABC1234567-123}}

EVA Ratchet Wrench Part Number

Output:

Note: the following data is pulled from the IMS database via a third-party script. **Use the IMS Client before making mission decisions.**

- ISS
 - LAB 1
 - LAB 1Ext
 - Z1 TRUSS EXT
 - Z1 Stbd Tool BoxNA_001
 - EVA Ratchet1016**
 - Palm Wheel1018
- AIRLOCK
 - Overhead
 - O0
 - O0->
 - 1.0 CTB1161
 - EVA Ratchet1011**
 - EVA Ratchet1012**
- CREWLOCK
 - Crew Lock IVA Bag1002
 - Adjustable Fuse Tether1032
 - EVA Ratchet1015**
 - 7/16 x 2" Rigid1006



Statistics



- 2846 Content pages
- ~48,985 Edits since start of wiki
- 572 Registered Users
 - 480 Viewers (Read capability and can edit talk pages)
 - 86 Contributors
 - 6 Administrators
- Received NASA JSC Director Innovation Award in 2013
- Created 4 new wikis outside EVA